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Courier Press, Leamington Spa, England.

Description

This invention relates to a shutter of the kind which comprises a series of inter-connected strips which extend laterally of the shutter so as to provide a flexible form of shutter or door capable of negotiating bends during its opening and closing operation. Shutters of this kind are used as closures for boxes and containers such as cassettes containing bank-notes, vertical filing cabinets, and for doors for garages, lock-up shops etc.

An object of this invention is to provide a shutter which is inexpensive to manufacture, has a minimum of parts, and is substantially tamper-proof when used in appropriate circumstances such as when used as a cassette door.

AT—B—236 093 discloses a flexible shutter comprising a series of interconnected strips which extend laterally of the shutter, each strip having at each end integral male and female connecting members whereby the strips may be joined in series to form the shutter each strip also comprising a recess running the length of the strip adapted to receive a corresponding overlapping portion of an adjacent strip.

The present invention is characterised in that the male and female members extend outwardly from shoulders on the end faces of the strips so that when the male and female connecting members are engaged the female members abut the shoulders whereby relative lateral movement of the strips is prevented. The strips are preferably individually formed by injection moulding.

Preferably the individual strips are formed from plastic material.

The strips may be reinforced by embedding reinforcement wires or reinforcement strips in the individual injection moulded plastic strips.

Each of the strips may be formed with a protruding tongue and a recess so positioned that when the strips are joined at their ends the tongue of one strip enters the recess of an adjacent strip so as to interlock the strips to prevent tampering and to allow flexibility of the strips.

An important preferred feature of the invention is that the ends of the strips forming the shutter are engaged in guides at each side of the cassette so that the male and female connecting members are totally enclosed within the guides.

The shutter may be used as the door of a cassette, particularly a cassette intended to contain bank-notes, and in this case the ends of the strips forming the shutter are preferably engaged in guides at each side of the cassette so that the male and female connecting members are totally enclosed within the guides.

In the accompanying drawings:—

Figure 1 is an isometric view of a bank-note cassette having a shutter door made in accordance with the invention;

Figure 2 shows one of the injection moulded strips which will form the shutter door;

Figure 2A shows an enlarged view partly in section of the same strip;

Figure 3 shows the way in which the individual strips of Figure 2 are assembled to form a shutter; and

Figure 4 is a section through one end of an assembled shutter illustrating the inter-engaging male and female portions which are enclosed within a guide on the cassette.

The bank-note cassette shown in Figure 1 is shown in more detail in our published UK Patent Specification No. 2039264A.

The cassette is in the form of a strong box 6 which has at one end a shutter 7 formed of a number of strips 8 made in accordance with the invention. The lateral ends of the strips forming the shutter are, when the shutter is closed, engaged in guides 9 and 10 at the sides of the cassette. The guides are of U-shaped sections so as to receive the ends of the shutter.

The cassette is arranged so that when it is put into an appropriate machine a pair of rods 11 and 12 enter the cassette and operate mechanism to open the shutter.

The full details of this cassette will not be described but they may be obtained by reference to our published UK Patent Specification 2039264A.

In Figures 2 and 2A is shown a single moulded plastic strip adapted to form a shutter in accordance with the invention. In Figure 2A the strip 13 is shown broken into three parts for convenience of illustration but it will be appreciated that the three parts are injection moulded to form a single unitary strip with integral male and female connecting members 14 and 15 at each end of the strip as shown in Figure 2. These connecting members are formed adjacent a shoulder 16 so that when the connecting members are joined together the shoulder 16 prevents relative lateral movement of the strip because the inner surfaces of the female members 15 engage the shoulders 16 on adjacent strips. Throughout the length of the strip is formed a recess 17 (Fig. 2a) and a corresponding extension portion 18 so that when the strips are engaged to form a shutter the portions 18 lie in adjacent recesses 17 on adjacent strips thus forming a uniform shutter surface and preventing or substantially preventing tampering with the shutter.

To further strengthen the shutter and to assist in preventing tampering tongues 19 is formed on each strip and corresponding recesses 20 so that when the strips are joined together the tongues 19 of all the strips engage in recesses 20 of adjacent strip. This is best seen in Figure 3 where it is seen that several of the strips have been joined together by engaging the male and female inter-connecting members at their ends. The formation of the connecting members is such as to allow flexibility of the shutter, security in joining the strips to form the shutter and restriction of relative lateral movement of the strips.

When the shutter is used as the door of a cassette of the type shown in Figure 1 of the drawings the male and female inter-connecting members 14 and 15 will be totally contained

within the U-shaped guides 9 and 10 which extend around the bend at the front top edge of the cassette and into the area below the lid of the cassette.

A portion of the guide 9 is shown in Fig. 3 and also somewhat diagrammatically in Figure 4 with one end of the shutter shown contained within the guide. Portions of the ends of the strips forming the shutter are shown broken away and in sections to illustrate the way in which the male and female members are contained totally within the guides 9 and 10 and to illustrate the way in which the strips bend to follow the contour of the guides.

Because the male and female members at the ends of the shutter are contained within these guides and can be dimensioned so as to be a very close fit in the guides with virtually no play, the wear on the shutters is restricted.

Also by enclosing the inter-connecting male and female members totally in the guides it is very difficult for them to become disconnected or for anybody to attempt to disconnect them by tampering with the shutter.

The injection moulded plastic strips are very inexpensive and thus the total cost of producing a shutter may be reduced by making use of this invention.

The material used for the injection moulding of the strips is preferably glass filled acetal or nylon.

The strips 13 may be reinforced by embedding elongated reinforcement members such as Nylon cord, metal strips, rods or wires or glass or other fibres in the strips 13.

Claims

1. A flexible shutter comprising a series of inter-connected strips (13) which extend laterally of the shutter, each strip (13) having at each end integral male and female connecting members (14, 15) whereby the strips (13) may be joined in series to form the shutter, each strip also comprising a recess (17) running the length of the strip adapted to receive a corresponding overlapping portion (18) of an adjacent strip (13), characterised in that the male and female connecting members (14, 15) extend outwardly from shoulders (16) on the end faces of the strips (13) so that when the male and female connecting members (14, 15) are engaged the female members (15) abut the shoulders (16) whereby relative lateral movement of the strips (13) is prevented.

2. A flexible shutter according to claim 1 characterised in that the strips (13) are individually formed by injection moulding.

3. A flexible shutter according to claim 1 or claim 2 characterised in that the individual strips (13) are formed from plastic material.

4. A flexible shutter according to any preceding claim characterised in that the strips (13) are reinforced by embedding reinforcement wires or reinforcement strips in the individual plastic strips.

5. A flexible shutter according to any preceding

claim characterised in that each strip (13) is formed with a tongue (19) protruding radially and outwardly from the strip and a recess (20) so positioned that when the strips are joined at their ends the tongue (19) of one strip (13) enters the recess (20) of an adjacent strip (13) so as to interlock the strips to prevent tampering and to allow flexibility of the strips.

6. A flexible shutter according to any preceding claim characterised in that it is used as the door (7) of a cassette (6).

7. A flexible shutter according to claim 6 characterised in that the ends of the strips (13) forming the shutter are engaged in guides (9, 10) at each side of the cassette so that the male and female connecting members are totally enclosed within the guides.

Patentansprüche

1. Flexibler Verschluss, der eine Reihe von untereinander verbundener streifenförmiger Leisten (13) aufweist, die in Querrichtung des Verschlusses verlaufen, wobei jede streifenförmige Leiste (13) an jedem Ende einteilig ausgebildete Steckverbindungsteile (14, 15) hat, wodurch die streifenförmigen Leisten (13) in einer Reihe zur Bildung des Verschlusses verbunden werden können, und wobei jede streifenförmige Leiste eine Ausnehmung (17) aufweist, die in Längsrichtung der streifenförmigen Leiste verläuft und derart ausgelegt ist, daß sie einen entsprechenden überlappenden Abschnitt (18) einer benachbarten streifenförmigen Leiste (13) aufnimmt, dadurch gekennzeichnet, daß die Steckverbindungsteile (14, 15) von den Schultern (16) an den Endflächen der streifenförmigen Leisten (13) derart nach außen verlaufen, daß, wenn die Steckverbindungsteile (14, 15) ineinandergreifen, die Aufnahmeteile (15) an den Schultern (16) anliegen, wodurch eine relative Querbewegung der streifenförmigen Leisten (13) verhindert wird.

2. Flexibler Verschluss nach Anspruch 1, dadurch gekennzeichnet, daß die streifenförmigen Leisten (13) einzeln durch Spritzgießen ausgebildet sind.

3. Flexibler Verschluss nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß die einzelnen streifenförmigen Leisten (13) auf Kunststoffmaterial ausgebildet sind.

4. Flexibler Verschluss nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die streifenförmigen Leisten (13) dadurch verstärkt sind, daß Verstärkungsdrähte oder Verstärkungstreifen in den einzelnen streifenförmigen Kunststoffleisten eingebettet sind.

5. Flexibler Verschluss nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß jede streifenförmige Leiste (13) mit einer Zunge (19) ausgebildet ist, die von der streifenförmigen Leiste radial und nach außen vorspringt, sowie mit einer Ausnehmung (20) ausgebildet ist, die derart vorgesehen ist, daß, wenn die streifenförmigen Leisten an ihren Enden verbunden sind, die Zunge (19) einer streifenförmigen Leiste (13)

in die Ausnehmung (20) einer benachbarten streifenförmigen Leiste (13) eintritt, so daß die streifenförmigen Leisten ineinandergreifen, um einen unerlaubten Eingriff zu verhindern und den streifenförmigen Leisten eine Flexibilität zu verleihen.

6. Flexibler Verschuß nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß er als Tür (7) an der Kassette (6) verwendet wird.

7. Flexibler Verschuß nach Anspruch 6, dadurch gekennzeichnet, daß die Enden der streifenförmigen Leisten (13), die den Verschuß bilden, in Führungen (9, 10) an jeder Seite der Kassette in Eingriff sind, so daß die Steckverbindungssteile vollständig in den Führungen eingeschlossen sind.

Revendications

1. Volet à rouleau flexible comportant une série de baguettes interconnectées (13) qui s'étendent latéralement par rapport au volet à rouleau, chaque baguette (13) comportant, à chaque extrémité, des organes de raccordement mâles et femelles (14, 15) formés d'un seul tenant, ce qui permet de réunir les baguettes (13) en série afin de former le volet à rouleau, chaque baguette comprenant également un renforcement (17) s'étendant sur la longueur de la baguette et adapté pour recevoir une partie en recouvrement (18) d'une baguette voisine (13), caractérisé en ce que les organes de raccordement mâles et femelles (14, 15) s'étendent vers l'extérieur à partir d'épaulements (16) ménagés sur les faces d'extrémité des baguettes (13) de sorte que, lorsque les organes de raccordement mâles et femelles (14, 15) sont en prise réciproquement, les organes femelles (15) sont en butée contre les épaulements (16), ce qui empêche tout déplacement latéral relatif des baguettes (13).

2. Volet à rouleau flexible selon la revendication 1, caractérisé en ce que les baguettes (13) sont formées individuellement par moulage par injection.

3. Volet à rouleau flexible selon la revendication 1 ou 2, caractérisé en ce que les baguettes individuelles (13) sont réalisées en une matière plastique.

4. Volet à rouleau flexible selon l'une quelconque des revendications précédentes, caractérisé en ce que les baguettes (13) sont renforcées par des fils de renforcement ou des baguettes de renforcement noyées dans les baguettes individuelles en matière plastique.

5. Volet à rouleau flexible selon l'une quelconque des revendications précédentes, caractérisé en ce que chaque baguette (13) comporte une languette (19) faisant saillie radialement et vers l'extérieur à partir de la baguette, et un renforcement (20) disposé de telle sorte que, lorsque les baguettes sont réunies au niveau de leurs extrémités, la languette (19) d'une baguette (13) pénètre dans le renforcement (20) d'une baguette voisine (13) de manière à verrouiller mutuellement les baguettes en empêchant une tentative de pénétration et en conférant un caractère flexible aux baguettes.

6. Volet à rouleau flexible selon l'une quelconque des revendications précédentes, caractérisé en ce qu'il est utilisé en tant que porte (7) d'une cassette (6).

7. Volet à rouleau flexible selon la revendication 6, caractérisé en ce que les extrémités des baguettes (13) formant le volet à rouleau s'engagent dans des guides (9, 10) prévus des deux côtés de la cassette de sorte que les organes de raccordement mâle et femelle sont totalement renfermés à l'intérieur des guides.

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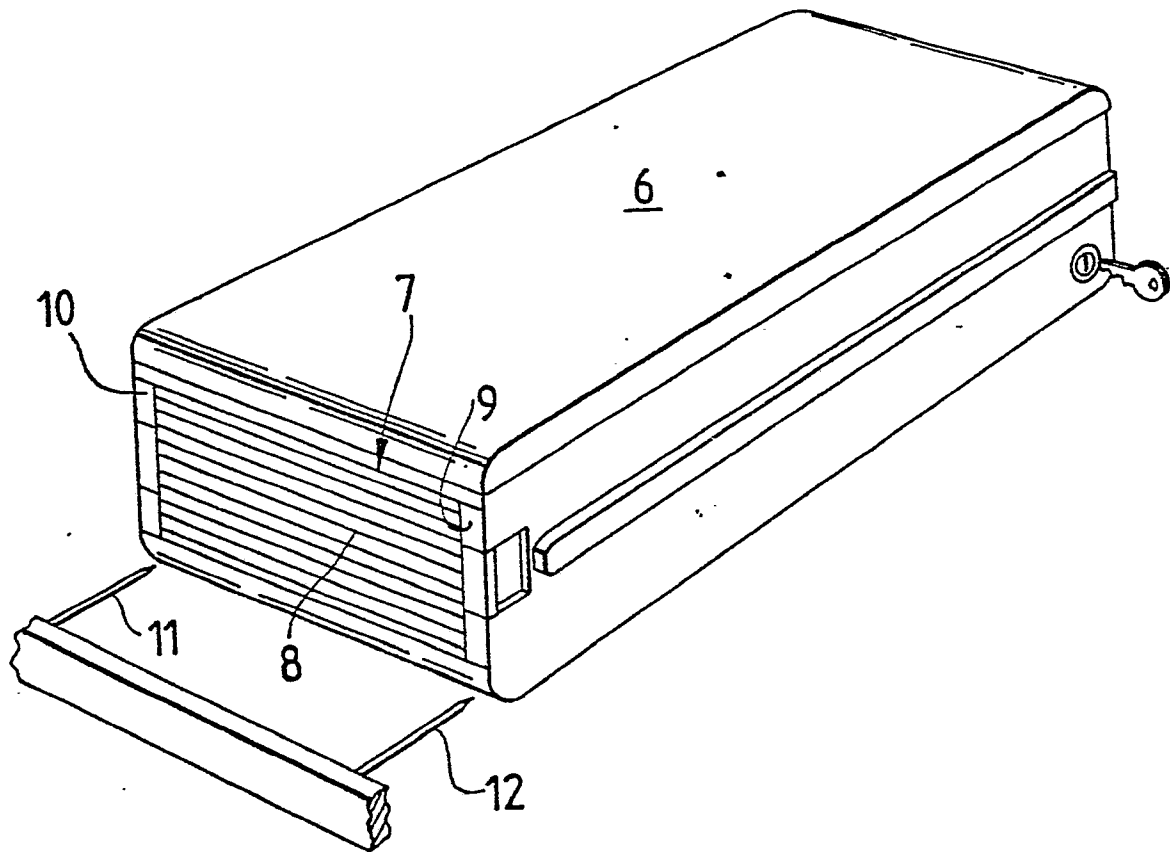


FIG.1.

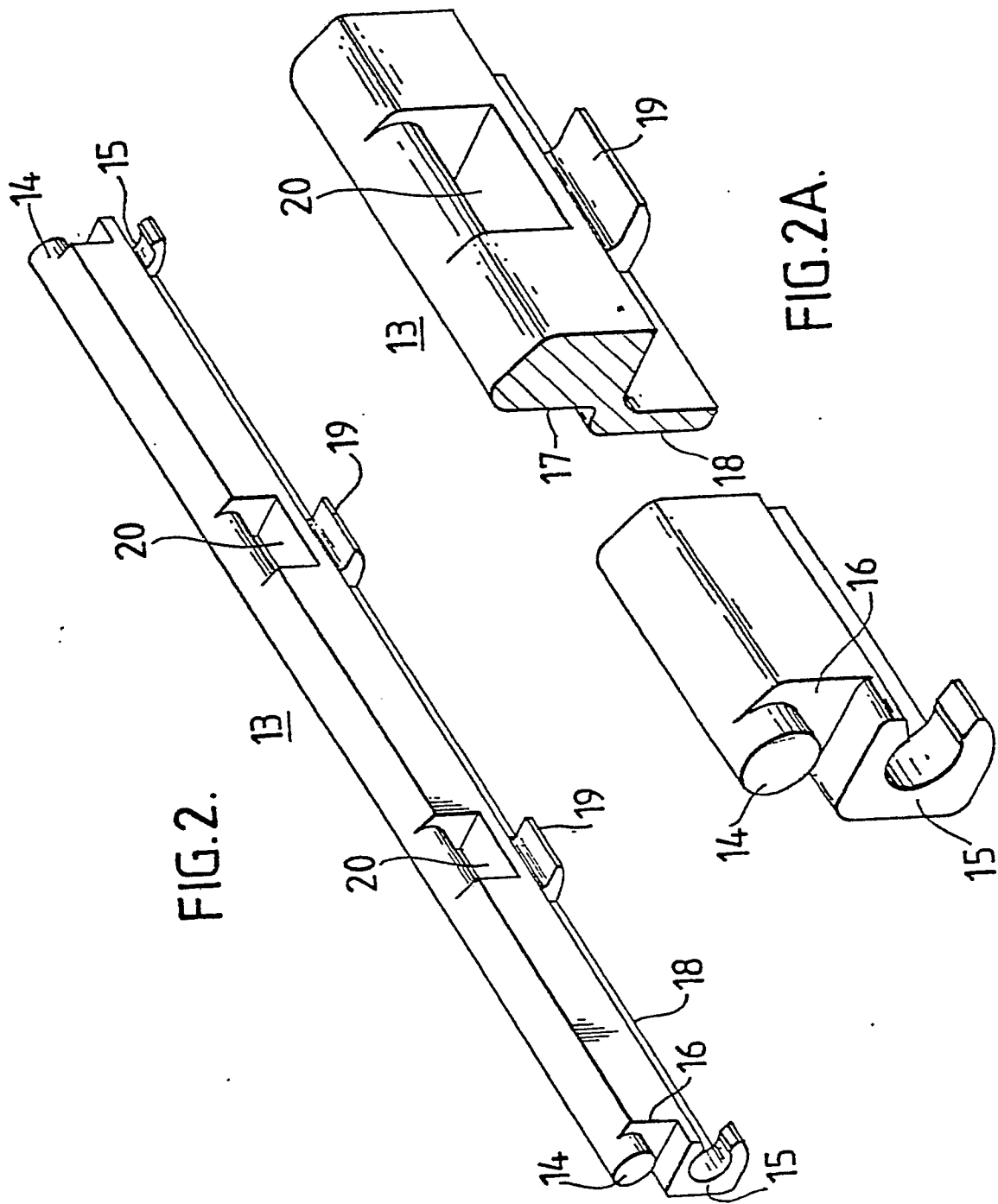
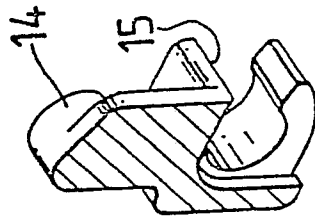
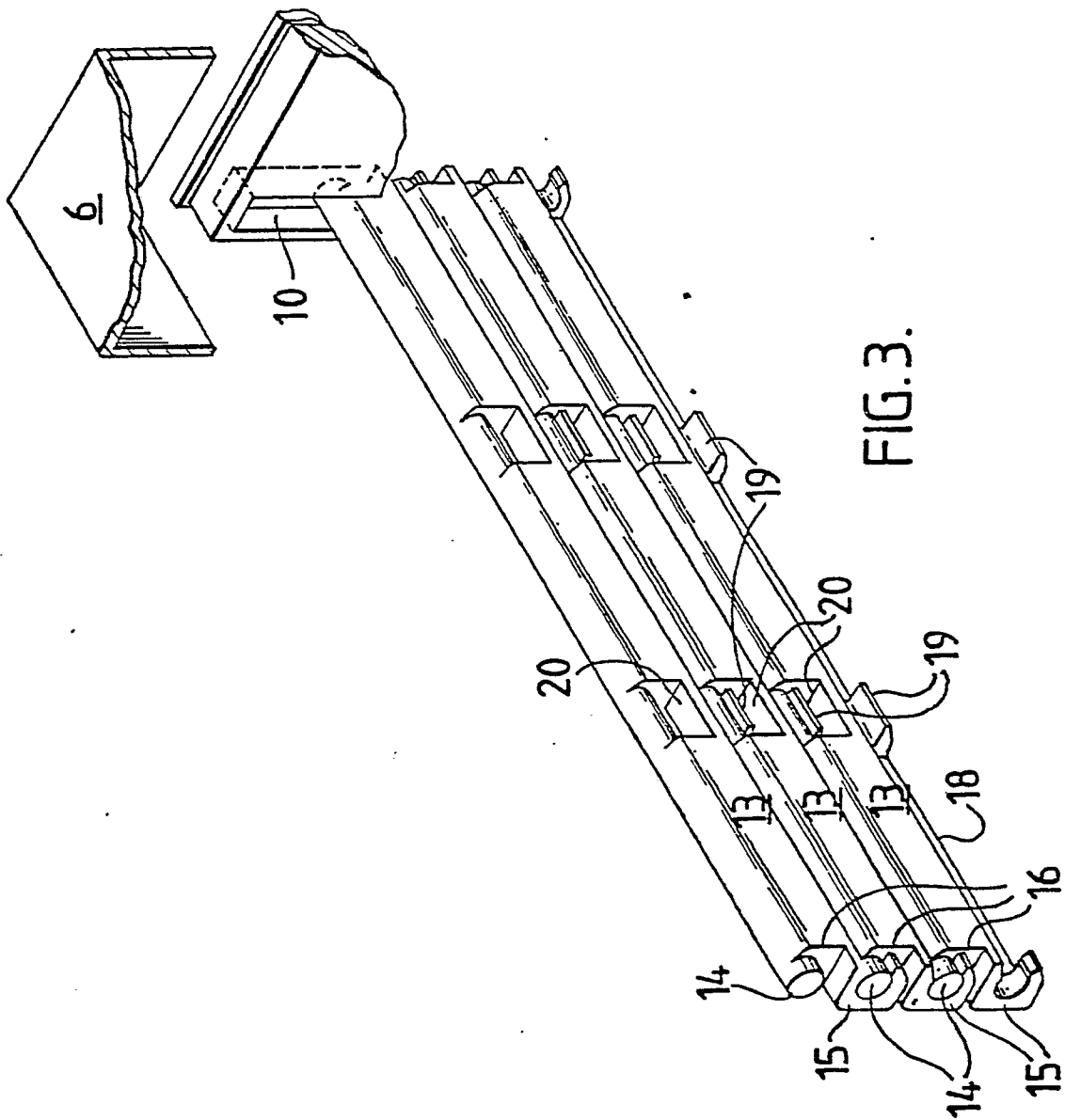


FIG. 2A.



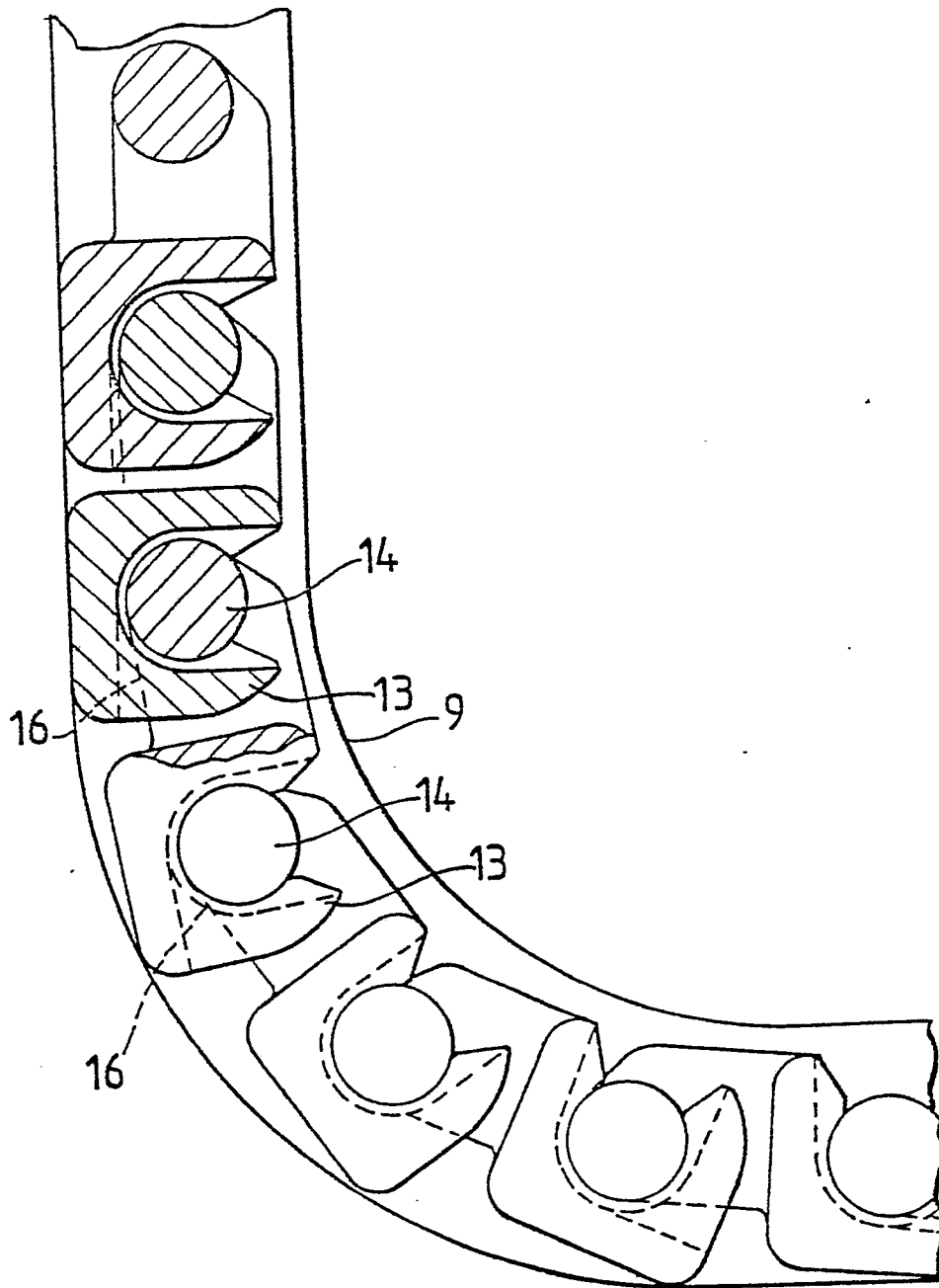


FIG.4.